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TYPICAL PROJECT QUALITY PLAN



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QUALITY PLAN

For

PROJECT DESCRIPTION

(RFX/RFQ #)

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PLANT NAME

To be carried out by

EXPERTISE CONTRACTING CO. Ltd.

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GENERAL STATEMENT AND SCOPE

This Project Quality Plan describes and outlines the Procurement, Construction and Installation, as indicated in the Contract document applicable Standards and Codes, and Project Specifications by Expertise Contracting Co. Ltd.

The scope of work shall include Procurement, Construction and Installation as detailed in contract.

- To be responsible for the design and procurement of all materials and labor required to Manufacture, construct, install and test the facilities.
- To be responsible for commissioning and start-up of all such facilities and for its operation until performance has been satisfactorily demonstrated, and all system have been accepted and taken by CLIENT.
- To provide access to CLIENT to carry out field inspections of completed Systems and shall rectify any and all punch list items from such inspections CLIENT's satisfaction.
- To be responsible for defining and agreeing in detail all scope interface points.
- To be responsible for defining and agreeing a detailed System Completion Schedule.
- The schedule shall specify milestone.
- To provide System Dossiers of Construction and Commissioning QC documentation to CLIENT for review and approval.
- To provide As-built documents including As-built revisions of drawings previously extracted for construction and erection purposes.

This Quality Plan has been developed and shall be implemented to ensure that all 'activities' are controlled and documented records are maintained to ensure full compliance with the Contract requirements.

This Quality Plan shall be issued as a controlled document. The issuance of this document shall be as listed on page 6 of this document. The Quality Manager shall ensure that all amendments are issued to the holders of controlled copies.

The Project Manager shall ensure that the Technical and Quality requirements are fully complied with during the Engineering, Procurement & Construction phases of the Project. In addition it shall be his responsibility to ensure total fulfillment of all contractual obligations and the maintenance of a good Client relationship.

The Quality Assurance Department shall ensure compliance with the Project Specifications, Drawings, Standards, Codes, etc. Shall conduct documentation reviews, planned audits and management review meetings to ensure that the Project Quality Plan is effective and shall identify any required modifications.

The Quality Control Department shall ensure compliance with the Project Specifications, Drawings, Standards, Codes, etc. by performing surveillance and planned inspections in accordance with the Project approved Inspection and Test Plans. Shall issue non-conformance reports Doc. No. FM-DIV00-QAC-0003 where standard deviations have been identified.

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1.0 DISTRIBUTION LIST OF CONTROLLED PROJECT QUALITY PLAN

Position

Controlled Copy No.

Expertise Contracting Co. Ltd. (ECC)
QA/QC Manager (original)

-

Expertise Contracting Co. Ltd. (ECC)
Project Manager

01

CLIENT

02

2.0 Issue / Revision Record

Issue No.	Revision	Paragraph	Description	Date
1	00	All	Issued for Bid	10-08-2016
2	01	Annexure 1	Organization chart	15 th Dec 2019

- ❖ Revised project quality Plan shall only be issued based on comments from the client, specific to the project.
- ❖ The revision number and date shown on all pages shall identify revision to this project quality Plan. Upon revision, the complete project quality Plan shall be re-issued.
- ❖ An updated log of revisions shall be issued with each revised project quality Plan.

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3.0: POLICY STATEMENT

The Project quality policy is designed to provide a quality system based on the best working practices that can continuously operate to meet the standards demanded by our Customers, & the requirements of ISO 9001:2008 Quality Management System.

This policy will be implementing in order to specify and define common rules of the project development prevailing over the whole project lifetime. Quality Policy Document enables performance of project tasks to reach the quality of final results consistent with the project requirements. The quality policy is to achieve sustained, satisfaction growth by providing products and services which consistently satisfy the needs and expectations of all participants involved: partners, beneficiaries, stakeholders etc.

The Project quality Policy is designed to deliver the quality by:

- Ensuring that ECC understands the requirements and expectations of the client.
- Ensuring the process is in place to plan, monitor and records all elements of the project.
- Set quality objectives which shall be monitored and reviewed for effectiveness and suitability.
- Ensuring in place to manage non-conformances.
- Ensuring the process of continuous improvements.
- Getting the feedback from customers & clients to identify their perception & satisfaction of the services we provide.

Management have the responsibility and duty to ensure that all personnel engaged in tasks which influence this quality, are aware of their obligations, not only to the company but also to the client requirements, and are properly trained and provided with adequate resources. This policy shall be communicated to ECC project staff and suppliers.



.....
Mohammed Ashif
Chief Executive Officer

.....15/12/2019
Date

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4.0 **OBJECTIVE**

- 4.1 The objective of this Project Quality Plan is to ensure that, through a process of self-regulation, the works shall comply with the requirements of the contract/subcontract documents.
- 4.2 To ensure that the Contractual targets of the Project are achieved.
- 4.3 To achieve Contractual targets of the Project, all the planning, preparation and work execution conducted by both Client and ECC shall be in accordance with the procedures and work instruction provided by the Client management.
- 4.4 To ensure that all reasonable resources necessary to manage the Project are being recurred according to work schedule.
- 4.5 To ensure continual improvement of resources in terms of Project management skills and personnel competence level to cope with work requirements.

It is recognised that everyone involved with the project is responsible to deliver the quality. Quality must be considered as a core value that is to taken into account by ECC project staff and suppliers in all their project related activities.

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5.0 QUALITY SYSTEM ELEMENTS

5.1 Management and Organization

5.1.1 Quality Organization

The structure of the Project Quality Control Organization is shown in Appendix 1. Essential positions, responsibilities and authority, related to Project Quality Management are detailed.

5.1.2 Responsibilities and Abilities

5.1.2.1 Project Manager of ECC

1. Directs overall Project Management, including day-to-day authority and responsibility for time, cost, safety and Quality Management.
2. Determines policy and actively supports quality management for the project.
3. Provides support to the QC Manager in the implementation of the Project Quality Plan.

The Project Manager shall also be responsible for the overall site management of the contract including meeting, Project Specification, Cost and Planning Control Safety, monitoring and execution of the works until the handing over of the Project.

5.1.2.2 Project Quality Control Manager

Comply with the Project Quality Plan and monitor field QA/QC activities in accordance with the contract. He shall have responsibility and authority that includes ensuring the processes needed for the QMS. System are established, implemented and maintained in accordance with the requirements of the contract. He shall report to Project Manager on the performance of the QMS and any need for improvement in the area of Quality and Technical safety of the work and ensure the promotion of awareness of the contract quality requirements throughout the organization. He shall have the authority to directly remove and replace any defective work. He shall have no job related responsibility other than the QA/QC.

5.1.2.3 QA/QC Engineers

The role and responsibility of the QA/QC Engineer shall include the following activities:

- 1 Control and Verification of the Quality Management System
- 2 Preparation of the Quality Plan, control procedures and work instructions applicable to the work phases.
- 3 Review of vendors and subcontractors contract quality deliverables.
- 4 Report on quality activities and act as the focal point for quality related issues.
- 5 Carryout inspection of works by the ECC and nominated subcontractors and suppliers as directed by the ECC QA/QC Manager.
- 6 ECC QA/QC Engineer shall be responsible for the management of the QC Formats related to the ECC work.

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5.1.2.4 Inspection Personnel (QC Inspectors)

The QC Site inspectors are directly responsible to the Project Quality Control Plan. Moreover,

1. They shall report directly to the Project Quality Control Manager in cases of non-conformance.
2. They shall monitor the work of a third party independent qualified inspection and testing agency for the surveying, concreting and material testing.
3. They shall be responsible for the quality control of purchasing including the review of purchase orders to ensure compliance to the specification, conduct inspections/ physical verifications on the supplied material, and inspection of project materials, review suppliers quality documentation and the preparation of inspection and test plans for material clearly determining the level of Inspection required.
4. They shall monitor the works in progress and conduct preliminary inspections of completed work prior to requesting the inspection to Client.
5. To inspect incoming materials (relative to his discipline) against the appropriate documentation to ensure that the material is within specification and complete with all the relevant documentation.
6. To raise site inspection sheets with checklists.
7. To maintain quality records in an orderly and easily accessible manner.
8. To ensure that external and internal testing schedule is conducted and test results are reviewed for compliance.
9. To raise and document site non-conformances and investigate the corrective action.
10. Material receiving inspector's shall verify that the purchased/procured materials are of good quality and defective materials are not used & rejected outright before they are imported at the yard for storage.

5.1.2.5 Site Lead / Site Superintendent

1. Supervise the day-to-day activities of all supervisors, foreman and workers.
2. Ensure that approved products are available and that the correct labor and equipment is available to successfully complete the works in accordance with specified quality requirements.
3. Assist in the training of supervision and labor in the correct interpretation and implementation of the Expertise Contracting Co. Ltd. (ECC) Work Procedure and approved method statements by Client.
4. Assure that suitability qualified and skilled personnel are employed to carry out the work.
5. Monitor the performance the supervision and labor to ensure that quality levels and workmanship are of the standard required for the project.

5.1.2.6 Document Controller shall be responsible for

1. The day-to-day activities of the document control office inclusive of the receiving, reproduction, issuing, and transmittal of all documents.
2. Maintaining and update of the relevant documents control database.
3. Maintaining Records associated with this procedure.

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5.2 Quality Management System Requirements

5.2.1 Documentation Requirements

ECC has established a document control system through a document controller to maintain and controlled all project related documents and issue the latest revision, moreover his responsibility is to arrange availability of these documents at all the times for performing operations when necessary according to quality system.

The documents related to the Project Include

1. Project Quality Plan
2. Quality Procedures
3. Work Instructions / Method of Statement
4. Construction Drawings and Technical Specifications
5. Records of Incoming and outgoing submittals
6. Records of Incoming and Outgoing Letters
7. Customer Approved Material List
8. Inspection Checklist and Test Reports
9. Subcontractors Documentations
10. Client Specifications
11. Health and Safety Plan
12. Project Execution Plan & Construction Strategy

ECC shall make all the referenced documentations are available for ECC/Client use at its procurement and Construction locations.

5.2.2 Quality Manual

ECC have established and maintains the Quality Manual in accordance with the ISO standard. The Quality Manual identifies the scope of the Quality Management System. It includes procedures and documents covering work activities. It includes a description of sequences and interactions of processes that fall under the scope of the Quality Management System.

5.2.3 Logbook Entry

ECC QC-team and Client can log quality violations in the Log Book/surveillance report Log. The type of LBE can be defined as mentioned below;

13. **During surveillance:** Any violation found during surveillance visit.
14. **During inspection:** Any violation found during performing inspection.
15. **After the fact:** Any violation found after inspection.
16. **Proactive:** Any proactive advice or suggestions prior to its execution.
17. **Repetitive violation:** If found repetitive violation.

- ECC, QC Engineer shall be the custodian of Logbook Entry file and is available in his office.
- Logbook Entry shall be issued by ECC QC personnel and Client staff.
- ECC, QC Engineer shall inform the issuance of LBE to concerned Construction Leader.

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- Within 48 hours the Construction leader shall provide the proposed corrective & preventive actions on the Logbook Entries and shall be reviewed & accepted by LBE issuer.
- Closing of LBE shall be in one week time from the date of issue.
- If LBE is not closed in one week time then ECC, QC representative will issue NCR and this NCR has to be closed in two weeks' time but proposed corrective and preventive actions to be provided within 48 hrs.
- Log shall be maintained by QC Document Controller on regular basis and shall be included in Quality control report.

5.2.4 Role and Responsibilities of Independent Test Laboratory

ECC have employed the Independent test laboratory acceptable to CLIENT for the performance of Quality Control testing such as soils, concrete, masonry, water asphalt and NDE at the work site and at laboratory.

Duties of Independent Test Laboratory

- a) Provide qualified personnel for conducting inspections and tests at site and /or off-site.
- b) Ensure that laboratory performs only tests for which it is adequately equipped and staffed.
- c) Provide an adequate well maintained and calibrated equipment to perform the required testing services.
- d) Perform all testing and inspection operations in accordance with the appropriate standards, as per contract requirements.
- e) Promptly notify ECC of any irregularity or deficiency of equipment/ material noted during the process of inspection/ testing.
- f) Maintain accurate and complete records of all tests performed and promptly submit the reports of all tests specified, including compliance or non-compliance with the specifications.

Limitation of Testing Agency

- 1) Agency shall not release, revoke, alter, or enlarge the requirements of the contract documents.
- 2) Agency shall not approve or accept any portion of work.
- 3) Agency shall have no authority to stop the work.

5.3 Management Responsibilities

5.3.1 Management Commitment

The top management of ECC is committed to the development and improvement of the quality management system by:

- Communicating the importance of meeting, regulatory, and legal requirements through regular tool box meetings.
- Ensuring the establishment of a quality policy.
- Ensuring the availability of necessary resources in accordance with Recruitment and Employee's Training & Development.
- Ensuring the Quality planning and resources.

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5.3.2 Quality Objective

In line with our Quality Policy for pursuing continual improvement, the Executive Management have established the following corporate objectives as a measure of our improvements in client satisfaction, process performance, productivity, relations with suppliers and competence of our people:-

- I. Planning and Process control shall meet the Client specific requirements regarding performance, reliability and safety services at all levels strictly comply with the applicable standards.
- II. Selection, approval and re-evaluation of vendors fundamentally based on the quality of their products and process.
- III. Continual efforts to improve quality and productivity of ECC services.
- IV. Periodically audit and review the effectiveness of the Quality System and initiate appropriate corrective actions as and when required.
- V. Providing appropriate job related and Quality System related training to the employees at all levels.
- VI. To continually reduce the level of non-conformance – not only in the products and services provided, but also in the Quality management System itself.

In addition to forming a basis for improvement, these objectives also form a focus for all of our staff.

5.3.3 Project Quality Plan (PQP)

Project Quality Plan showing various activities to be carried out to meet the requirements of Quality shall be prepared and implemented in the project (the requirements of clients and nature of work varies from project to project). Project Quality Plans shall be implemented as required by the customer for the specific project. However, the integrity of the ECC Quality Management System shall be maintained when changes are made and implemented.

5.3.4 Management Representative (MR)

Planning engineer is appointed as the Managing Representative's by the top management. The designated Management Representative's (MR's) are responsible for ensuring that the quality system as set out in this manual is effectively implemented and maintained. In consultation with the MR's, the Project Manager (PM) shall assign Quality Control Representatives (QCR) to coordinate the Quality System activities at site level. MR's has full authority and organizational freedom to:

- 1 Initiate action to prevent occurrence of non-conformity.
- 2 Recommend or provide solutions through designated changes.
- 3 Review the implementation of solutions.

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- 4 Hold any part of the work, which is affecting the quality, or the safety of the services as per the Quality System.

5.3.5 Management Review

Based on the results of Internal Audits, Client complaints, internal non-conformities regarding quality and safety, Corrective and Preventive actions and Quality Performance Analysis, a Management Review Meeting is held once in every six months to monitor the effectiveness of the Quality System in achieving the objectives of Quality Policy.

This meeting is attended by CEO, PM, CM, QCM and all Dept. Heads. Concerned managers are informed about non-conformance and corrective actions that need to be taken. The MR / QCM shall monitor the implementation of corrective actions. Records of Management Review Meetings are prepared and circulated to all concerned.

A copy will be maintained at MR Office. Any difference of the opinion between the participants, are resolved by the CEO.

Reference: Management Review Meeting Procedure: PR-DIV00-0005

5.3.6 Resource Management

ECC shall provide adequate resources for the implementation of the Quality System.

Quality Control personnel after allocating their corresponding tasks will be mobilized to the project prior to commencement of the work to be done.

It is the responsibility of ECC Management to identify resource requirements and to allocate adequate resources for the management, performance and verification of work. Resource requirements are regularly reviewed as a part of management quality system review (clause 5.3.5).

All project personnel shall be adequately trained if needed to perform their tasks.

5.3.7 Quality Reporting

The ECC shall report on the effectiveness of the Quality management system and on all works related current and planned quality activities. The report format shall include as a minimum but not limited to the following key activities.

1. Progress this month:
2. Work Accomplished
3. Inspections and tests conducted
4. Results of Inspections and tests
5. Nature of defects found
6. Causes of rejection
7. Corrective actions taken
8. Look ahead to next month
9. Document development and approval status
10. Audit Programme & Findings status
11. Key performance indicators status

The report shall be submitted as signed by the authorized QA/QC Manager with the following certification.

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5.3.8 Concessions (Waivers)

The ECC have prepared a documented Procedure and approved by CLIENT In order to effectively control, review and evaluate any request by ECC and its Subcontractors/Vendors for a concession.

A concession is any deviation from any specification design codes and standards, drawings, National or International regulations and legislation and other technical information contained in the contract.

All concessions requests are submitted to CLIENT for review prior to acceptance or rejection. ECC have maintained a Log of Concession request approval status.

5.3.9 Inspection Reports and Checklist

Inspection checklist to be used by QC personnel during all key construction and system take over activities. Inspection checklists are having provision for CLIENT to sign off as a witness.

The ECC is reporting the results of all inspections and tests in accordance with the contract requirement in daily quality control report. The results of inspections with all the related certificates, checklist and test data shall be included in the QC system completion dossier which shall be available for CLIENT review.

5.3.10 Material Storage and Traceability

After material receiving inspection has been carried out and completed the following steps shall be undertaken.

- All materials and consumables shall be stored in a dedicated storage area separated from stock materials or materials of other project.
- Material receipt areas shall have a clearly defined quarantine area where nonconforming material shall be placed until released.
- For pipes, fittings flanges and gaskets manufacturers identification method shall be followed fabricated spools shall be identified with heat, service class, line no & spool no.
- Electrical and welded items shall be uniquely identified and traceable to their P.O numbers certifications as required by the contract specifications.
- Instrumentation and valves shall be traceable by their respective tag numbers and P.O numbers and shall be stored as per manufacturer's instructions.
- Materials shall have full traceability to test certification and shall be maintained throughout the storage period.
- QC Inspector shall verify whether the materials/products are stored and identified in accordance with the manufacturer's instructions and the contract requirements.

5.3.11 Inspection and Test Plans (ITP'S)

The ECC and its subcontractors use approved ITP's specific to the scope of work. ITP shall be containing a detailed work activity breakdown tabulation commencing from first activity to final. References of acceptance criteria, specifications, codes & standards, method of statement and verifying document, checklists shall be maintain in the ITP. References of witness, inspection points for subcontractors, ECC, third parties if any and CLIENT.

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5.3.12 Material Testing

Material testing shall be identified on the inspection and test plan. The QC Engineer / Inspectors shall prepare a schedule for material testing showing test frequencies, acceptance criteria, applicable standards, test method and the testing agency.

All material test results shall be checked by the QC Engineer/Inspectors.

Nonconforming results shall be identified, investigated and recorded on a nonconformance report (FM-DIV00-QAC-0003). CLIENT shall be invited to attend any in-house or external testing and copies of all test results shall be sent direct to CLIENT showing test results, test criteria, test characteristics and applicable standards.

5.3.13 Inspection and Test Reports

Inspection and test reports shall be issued to CLIENT and attached in quality control report with details of date of inspection or test, purpose of the inspections or test, the type and extent of inspection and test activities carried out, Reference document used during the test, purchase order, requisition and revision number, ITP reference and results of the inspection and tests. All inspection and test reports are available for CLIENT review.

5.3.14 Final Inspection

Final inspections of completed areas of construction or installations shall be conducted by Project Manager / Quality Control Manager in order to ensure:

18. All quality documentation is verified and available
19. All aspects of the area are complete to specification
20. All snagging items are recorded and addressed
21. Temporary protection of works is identified and installed

5.3.15 Control of Quality Records

Quality records are maintained by the Project Document Controller – who is under direct control of the Project Manager – to ensure that the project has been executed in accordance with the project specification requirements.

All quality documentation shall be available for inspection by CLIENT upon request, and for audit by the company's internal audit anytime during working hours.

A record of site queries and its resolutions along with their dates of resolution shall be maintained and submitted during the coordination meetings for the Clients review.

All drawings / documents shall be numbered in conformity with the Client standard numbering system.

6.0 Inspection and Testing Requirements

6.1 Civil Inspections

6.1.1 Earth Works

1. Ensure that an approved supplier supplies the backfill/fill material and that all material has been approved.

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2. Verify through the result of a testing laboratory, that the materials being supplied are in accordance with the requirements of the contractual specification.
3. Ensure that all test equipment required, has been calibrated (with a copy of the calibration certificate enclosed with the equipment) and is in accordance with the requirements of the relevant standards and specifications.
4. Ensure that all testing is carried out in accordance with the Project specifications.
5. Ensure the completion of all documentation reference testing, inspection, recording and reporting.

6.1.2 Concrete Works

1. Ensure that concrete is supplied by an approved / certified supplier and that all design / trial mixes have been approved by SAFCO.
2. Verify through the services of a testing laboratory that the concrete supplier is furnishing the specified concrete ingredients and approved design mixes.
3. Ensure that only approved admixtures are used.
4. Ensure that all tests are carried out in accordance with the Project specifications.
5. Ensure the completion of all checklists.
6. Ensure the completion of Concrete Record of Cube / Cylinder Compression Tests.
7. Complete and maintain Concrete Placement Log.
8. Ensure receipt of properly completed Concrete Delivery Ticket, from each concrete delivery truck and that the following information (as a minimum) has been shown:
 - Contract Number
 - Name and location of Batch Plants
 - Serial number of ticket
 - Date
 - Truck Number
 - Name of Purchaser
 - Grade / mix description of concrete
 - Type of cement
 - Cement content
 - Water / cementations materials ratio
 - Nominal maximum size of aggregate
 - Weight of fine and course aggregate
 - Type and name of admixture added
 - Quantity of concrete in cubic meters
 - Time loader
 - Temperature of concrete at loading
9. Ensure the completion of all documentation reference testing, inspection, recording and reporting.
10. Ensure the concrete slump, temperature and set of compression test specimens are made as per specification.

6.1.3 Grouting Inspection

1. Verify that all materials and installation procedures have been approved prior to the start of the grouting activities.
2. Verify that the foundations have been constructed to the correct co-ordinates and elevations, in accordance with the requirements of the approved construction drawings and/or specifications.
3. Verify that the surface to receive grout has been well chipped / roughened and is free from laitance and loose material and that forms are correct, secure and oiled

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(release oil), all in accordance with the approved grout manufacturer's recommendations.

4. Verify that the materials to be grouted have been installed / erected to the correct orientation and elevation and that shims have been installed properly and fixed.
5. Verify that grouting activities have ensured the complete filling of the area beneath equipment / base plates with no voids, all in accordance with the requirements of the approved procedures and specification.
6. Ensure the completion of all doc documentation reference testing, inspection, recording and reporting.

6.2 Welding Control

6.2.1 General

This section describes the system for maintaining control of all welding, welding procedures and performance qualification in accordance with the requirements of the applicable engineering specifications, codes and standards. Qualification of welding procedure specification and welder performance shall be performed in accordance with the ASME Code, Section IX, except where otherwise specified.

All welding performed by direct hire or subcontract shall conform to procedures qualified to the job requirements. Approved welding procedures specifications shall be issued to all qualified welders and their supervisors. The responsible supervisors shall assure that all welders have a comprehensive knowledge of the welding procedure specification.

6.2.2 Qualifications

- 1 The Quality Control Engineer shall audit performance qualification test in accordance with the appropriate code, standard or specification.
- 2 Records of performance and qualification tests shall be maintained. Welder and welder operator performance qualification tests shall be recorded.
- 3 A complete list of welders employed stating the procedures for which they are qualified shall be maintained. This log shall be updated and re-issued each month, if revised during that month.
- 4 The Quality Control Engineer shall ensure that the Welding Procedure Specifications (WPS) and Procedure Qualification Records (PQR) are correctly qualified and approved. The Quality Control Engineer / Inspector shall inspect contractor and/or subcontractor work to verify that approved Welding Procedure Specifications and Procedure Qualification Records are available to welders and are in use.
- 5 When approved Welding Procedure Specifications and Procedure Qualification Records are not available, the Quality Control Engineer shall propose and qualify them in the field. The Quality Control Engineer / Inspector shall ensure that the contractors and/or subcontractors have the latest revision of the Welding Procedure Specifications with supporting Procedure Qualification Records in advance of the anticipated welding requirement.
- 6 The Quality Control Engineer shall submit welder performance qualifications to the CLIENT's Quality Assurance Manager for review and approval. These documents shall be submitted early enough so that adequate time is available for review without causing delays in the work.

6.2.3 Welding Material

- 1 Procurement, receiving inspection, and issue of weld material shall be governed.

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- 2 The Quality Control Inspector shall ascertain that welding material conforms to the specified requirement in the approved welding procedure.

6.2.4 Welding Inspection

- 1 Welds shall be inspected in accordance with applicable codes and project documents. The following visual inspection parameters are a minimum. Results of inspections are to be recorded on the relevant inspection reports as listed on the Inspection and Test Plans.
- 2 Inspect tack welds that are to be incorporated into the final weld. Assure absence of defects; assure proper blending.
- 3 Inspect preparation, joint configuration and cleanliness.
- 4 Inspect alignment and root opening. Assure use of proper pre-heat if required.
- 5 Assure that welders performing the work are qualified for the particular process and procedure.
- 6 Assure use of proper welding materials.
- 7 Inspect completed welds for proper reinforcement. Weld shall blend smoothly into base metal surface at the toe.
- 8 Inspect the weld for objectionable visual features such as undercut, porosity, etc.
- 9 Ensure that repairs are made by approved procedures.
- 10 Daily Weld Reports indicating all stages of the weld are to be produced.

6.2.5 Weld Identification

Weld Maps are to be prepared for each isometric using the Isometrics supplied by the Engineering as a basis.

6.2.6 Non-Destructive Examination (NDE)

- 1 A third party Non-Destructive Examination company will be submitted to the CLIENT for their approval prior to the work commencing.
- 2 An approved 3rd party examination company will carry out all Non-Destructive Examination requirements shown in the specification and by Contract as a minimum.

6.3 Structural Steelwork Inspection

6.3.1 Fabrication

- 1 Verify that all materials, fabrication procedures and shop drawings have been approved prior to the start of the fabrication activities.
- 2 Ensure that all test equipment required has been calibrated (with a copy of the calibration certificate enclosed with the equipment) and is in accordance with the requirements of the relevant standards and specifications.
- 3 Verify that all shop welders have been certified and approved.
- 4 Ensure that all welds have been inspected and tested in accordance with the requirements of AWS D1.1.
- 5 Verify that the fabrication of the structural steelwork is in accordance with the requirements of the approved construction / shop drawings and specifications.
- 6 Ensure that all steel sections have been painted in accordance with the requirements of the approved construction drawings and/or specification.
- 7 Ensure that each section has been labeled / identified correctly.
- 8 Ensure the completion of all documentation reference testing, inspection, recording and reporting.

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6.3.2 Erection

- 1 Verify that the foundations and anchor bolts have been constructed to the correct coordinates and elevations, in accordance with the requirements of the approved construction drawings and specifications.
- 2 Ensure that all test equipment required has been calibrated (with a copy of the calibration certificate enclosed with the equipment) and is in accordance with the requirements of the relevant standards and specifications.
- 3 Verify that all field welders have been certified and approved.
- 4 Verify that each bolting crew and welder has been assigned an identification symbol/mark and that all field connections have been identified for future possible referral.
- 5 Ensure that all welds have been inspected and tested in accordance with the requirements of AWS D1.1.
- 6 Ensure that the erection of the structural steelwork is in accordance with the requirements of the approved drawings and specifications.
- 7 Verify that the structure has been checked for verticality, levelness and alignment of members.
- 8 Verify the inspection of bolted connections to ensure the use of correct bolts and bolt tightness (torque), in accordance with the requirements of the approved construction drawings and/or specifications.
- 9 Ensure that all base plates have been correctly grouted (if required) prior to loading of structural steelwork.
- 10 Ensure that all steel sections have been checked for damages to paint finishes and made good/repaired as required, in accordance with the requirements of the approved construction drawings and/or specification.
- 11 Ensure the completion of all documentation reference testing, inspection, recording and reporting.

6.4 Piping Inspection

6.4.1 Steel Piping

- 1 Verify that all materials, welding procedures and shop / design drawings have been approved by CLIENT prior to the start of the fabrication.
- 2 Ensure that all test equipment required has been calibrated (with a copy of the calibration certificates enclosed with the equipment) and is in accordance with the requirements of relevant standards and specifications.
- 3 Verify that all welders have been certified and approved by a third party laboratory and CLIENT.
- 4 Ensure that all welding has been carried out in accordance with the approved welding procedures and by qualified, approved welders.
- 5 Verify that the correct specification / rating of pipes, valves and components have been used.
- 6 Verify that all fittings (branches, reducers, etc.) have been installed correctly and in accordance with the requirements of the approved construction/shop drawings and/or specification.
- 7 Verify that all lines, valves and components have been correctly located and aligned (including internal joint alignment) and that all pipe supports are positioned and installed in accordance with the requirements of the approved construction drawings and/or specification.
- 8 Ensure that all welds have been inspected and tested in accordance with the requirements of ASME B31.3 and job specifications.

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- 9 Ensure that all aspects of SAFETY are observed during hydro test activities.
- 10 Ensure that all hydro tests are carried out in accordance with the approved procedures and results recorded.
- 11 Ensure that all lines have been flushed, dried & cleaned.
- 12 Ensure that all lines have been re-instated in accordance with the requirements of the approved construction drawings and/or specification.
- 13 Ensure that all lines have been painted and/or insulated in accordance with the requirements of the approved construction drawings and/or specification.
- 14 Ensure the completion of all documentation reference testing, inspection, recording and reporting.

6.5 Mechanical Inspection

- 1 Verify that all materials, equipment, installation procedures and shop drawings have been approved prior to the start of the installation/erection activities.
- 2 Ensure that all test equipment required has been calibrated (with a copy of the calibration certificate enclosed with the equipment) and is in accordance with the requirements of the relevant standards and specifications.
- 3 Verify that foundations / anchor bolts have been constructed to the correct coordinates and elevations, in accordance with the requirements of the approved construction drawings and specifications.
- 4 Verify that all welders have been certified and approved.
- 5 Ensure that qualified, approved welders have carried out all welding in accordance with the approved welding procedures and specifications.
- 6 Ensure that the top surface of foundations have been prepared to receive grout prior to the installation/erection of equipment.
- 7 Ensure that all shims have been located and bedded in correctly.
- 8 Verify that the equipment has been installed to the correct orientation and elevation in accordance with the requirements of the approved drawing and/or specification.
- 9 Ensure that the preliminary alignment has been carried out and results recorded, in accordance with the requirements of the specification, prior to the start of the grouting activities.
- 10 Ensure that the grouting of the equipment has been completed, using the correct approved grout, all in accordance with the approved grout manufacturer's recommendations and the requirements of the approved drawings and/or specification.
- 11 Ensure that the final alignment has been carried out and the results recorded, in accordance with the requirements of the specification.
- 12 Ensure that all aspects of SAFETY are observed during any test/hydro test activities.
- 13 Ensure that all tests/hydro tests are carried out in accordance with the approved procedures and all results recorded.
- 14 Ensure the completion of all documentation reference testing, inspection, recording and reporting.

6.6 Electrical/Instrumentation Inspection

- 1 Verify that all materials, equipment, installation procedures and shop drawings have been approved, prior to the start of the installation activities.
- 2 Ensure that all test equipment required has been calibrated (with a copy of the calibration certificate enclosed with the equipment) and is in accordance with the requirements of the relevant standards and specifications.
- 3 Ensure that all aspects of SAFETY are observed when testing circuitry.
- 4 Verify that the correct specification/rating of cable has been used.

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- 5 Verify that all cabling has been correctly installed, located, tagged and aligned, all in accordance with the requirements of the approved drawings and/or the specifications.
- 6 Verify that all foundations/anchor bolts have been constructed to the correct
- 7 Coordinates and elevations, in accordance with the requirements of the approved construction drawings and specifications.
- 8 Ensure that all equipment (instruments, switchgear, transformers, etc.) have been installed in accordance with the requirements of the approved drawings, manufacturer's instructions and/or the specification.
- 9 Ensure that all fixtures, instruments, switchgear, etc., have been correctly wired in accordance with the requirements of the approved drawings, manufacturer's instructions and/or specification, prior to the carrying out of the testing activities.
- 10 Verify that all the necessary tests have been completed for all the cables, wires, fixtures, instruments, switchgear, systems, etc. and that the tests have been carried out in accordance with the relevant standards and specifications, and that all results have been recorded.
- 11 Ensure the completion of all documentation reference testing, inspection, recording and reporting.

7.0 Quality Dossier

The ECC QA/QC Engineer shall be responsible for ensuring that the Quality dossier contains all the information as stipulated in the Quality Plan.

8.0 Key Personnel

The following is a list of Key Personnel involved in the project.

1. **Project Manager**
2. **Site Lead / Site Superintendents**
3. **Planning Engineer**
4. **Construction Manager**
5. **Quality Control Manager**
6. **Quality Control Engineers & Inspectors**
7. **Project Document Controller**

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APPENDIX 1

EXPERTISE CONTRACTING COMPANY QA & QC DEPARTMENT ORGANIZATIONAL STRUCTURE DEPARTMENT LEVEL MANAGEMENT

